

BASELINE SURVEY: PHASE VII

NABARANGPUR DISTRICT

Special Program for Promotion of Millets in Odisha
(Shree Anna Abhiyan)



Submitted to
Directorate of Agriculture and Food Production,
Government Of Odisha
2025



ନବକୃଷ୍ଣ ଚୌଧୁରୀ ଉନ୍ନୟନ ଗବେଷଣା କେନ୍ଦ୍ର
Nabakrushna Choudhury Centre for Development Studies
ICSSR Institute in Collaboration with Government of Odisha

BASELINE SURVEY: PHASE VII

NABARANGPUR DISTRICT

Special Program for Promotion of Millets in Odisha
(Shree Anna Abhiyan)



Submitted to
Directorate of Agriculture and Food Production,
Government Of Odisha
2025



ନବକୃଷ୍ଣ ଚୌଧୁରୀ ଉନ୍ନୟନ ଗବେଷଣା କେନ୍ଦ୍ର
Nabakrushna Choudhury Centre for Development Studies
ICSSR Institute in Collaboration with Government of Odisha

Citation: *'Baseline Survey: Nabarangpur District 2023, Phase VII' Special Programme for Promotion of Millets in Odisha (Shree Anna Abhiyan, SAA), Nabakrushna Choudhury Centre for Development Studies, Bhubaneswar 2023*

© Copyright: Nabakrushna Choudhury Centre for Development Studies (NCDS)

STUDY TEAM

Dr. Sandhya R. Mahapatro

Project Director, SAA

Dr Biswabas Patra

Associate Project Director, SAA

Research Associates

Dr. Kishor Kumar Podh

Dr. Sitakanta Sethy

Research Assistant

Mr. Ankit Moharana



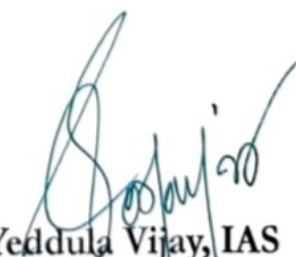
ନବକୃଷ୍ଣ ଚୌଧୁରୀ ଉନ୍ନୟନ ଗବେଷଣା କେନ୍ଦ୍ର
Nabakrushna Choudhury Centre for Development Studies
ICSSR Institute in Collaboration with Government of Odisha

FOREWORD

Sustainable Development Goal 2 seeks to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. Millets offer a promising solution to help accomplish these objectives. The Shree Anna Abhiyan (SAA) is a great initiative of Odisha government that shows the state's commitment to reviving the cultivation of millets that are not only climate-resilient but has significant implications on health and nutrition of people. The programme has brought different stakeholders to work together to reinstate the significance of millets in Odisha's agricultural landscape. I am delighted to have the opportunity to write this foreword for the 'Special Programme for Promotion of Millets in Odisha.'

The SAA programme has emerged from a consultation with diverse array of stakeholders including NCDS. A memorandum of understanding (MoU) was signed on February 27, 2017, bringing together key stakeholders including the Directorate of Agriculture and Food Production (DAFP), NCDS, and the Watershed Support Services and Activities Network (WASSAN). This MoU delineated the framework for concerted efforts towards implementing the SAA, with NCDS assuming the pivotal role of anchoring the research secretariat. NCDS embarked on a comprehensive survey initiative encompassing Baseline, Midterm, and End-line assessments in the designated blocks of the SAA. These surveys, designed to provide a situational analysis of the status of millet production, marketing, consumption, represent a critical step towards informed intervention and strategic decision-making. The findings of the baseline survey presented in the report would provide a situational analysis of the current status of the millet at the time of survey and a reference point to analyse the impact of intervention.

As the Director, I commend all the dedicated team members of NCDS for their unwavering commitment and tireless efforts in achieving the objectives of the SAA. Your hard work and perseverance have played a crucial role in turning our shared vision into reality. I also extend my heartfelt gratitude to our partners, stakeholders, and collaborators for their invaluable support and steadfast dedication in this direction.



Dr. Yeddula Vijay, IAS
Director, NCDS

ACKNOWLEDGEMENT

It gives me immense pleasure to extend my heartfelt gratitude to all those who contributed to the successful completion of the 'Baseline Survey Report of Phase VII, 2023'. This endeavour was truly a collaborative effort, and I am deeply grateful for the unwavering support and dedication demonstrated by each individual and organization involved. First and foremost, I would like to express my sincere appreciation to the research team of Nabakrushna Choudhury Centre for Development Studies (NCDS), Bhubaneswar, for spearheading the preparation of this report. Your commitments to excellence and tireless efforts have been instrumental in ensuring the quality and accuracy of the findings presented.

I extend my heartfelt thanks to the related government departments, organizations, and stakeholders, including farmers' associations, whose invaluable support and cooperation played a pivotal role in the successful completion of this study. Special mention goes to Dr. Arabinda Kumar Padhee, Principal Secretary to the Government, Department of Agriculture & Farmers' Empowerment (DA&FE), Mr. Prem Chandra Choudhury, Director of Agriculture DA&FE, and the Joint Director of Agriculture for their invaluable contributions.

I would like to extend my sincere appreciation to our esteemed Director, Dr. Yeddula Vijay (IAS) Additional Secretary to the Government, Planning and Convergence Department, Government of Odisha, and Director of Nabakrushna Choudhury Centre for Development Studies (NCDS). Your guidance, wisdom, and valuable suggestions have been invaluable in shaping the direction of this study. Many thanks to NCDS administration for their continuous support for smooth functioning of the research work. I want to acknowledge the contributions of Research team (Research Associates, Project Associates, Research Assistants) for their valuable insights and assistance.

I would also like to express my appreciation to the members of the Programme Secretariat (Watershed Support Services and Activities Network, WASSAN), particularly Mr. Dinesh Balam, Programme Secretariat, and the facilitating agencies and staff of the concerned areas under study for their support and cooperation. I am particularly grateful to Mr. Sushil Kumar Senapati, Ms. Kalpana Pradhan and Mr. Bikash Pradhan, along with the dedicated staffs of the State Project Monitoring Unit (SPMU), for their unwavering support and assistance throughout the duration of this project.

My sincere gratitude goes out to the Chief District Agricultural Officer (CDAO) of Nabarangpur district, the Scheme Officer, District Programme Coordinator, Block Coordinators, and other block-level officials for their invaluable support in providing crucial information. Once again, thank you all for your invaluable contributions, dedication, and support. It has been a privilege to work alongside each of you, and I look forward to continued collaboration in our future endeavours. I extend my best wishes for the success of the publication.

Dr. Sandhya R Mahapatro
Project Director, SAA

EXECUTIVE SUMMARY

Nabarangpur district is one of the 17 districts where the “Special Programme for the Promotion of Millets in Odisha or (hereafter) Shree Anna Abhiyan (SAA)” Phase VII has begun in the Kharif 2022 in Chandahandi block. Under the phase, there are total 417 target households are identified for the programme. Out of these, 80 households were selected through the random sampling method and conducted the Baseline Survey 2023, Phase VII, in Chandahandi block of Nabarangpur district. The survey revealed that among the sample households, 55 per cent belonged to Scheduled Tribe (ST), while 45 per cent of them belong to Other Backward Class (OBC)/ Socially and Educationally Backward Class (SEBC). As found, the total sample population is 399, of which 56.89 per cent are male, 43.11 per cent are female, and all the sample households belong to Hindu religion. Moreover, 100 per cent of the sample HHs is nuclear type of family.

As observed in the Baseline Survey, out of the total 399 sample populations in the block, majority of them (36.34 per cent) have completed their Class 6 to class 10, followed by 28.32 per cent completed up to Class 5. Another 8.02 per cent of them have Higher Secondary qualification, 2.01 per cent are Graduate, 1.75 per cent has Technical Education, and 3.26 per cent of them have other qualifications including Diploma and Nursing. Whereas it also found that a significant number (20.30 per cent) are illiterate and all sample households possess ration card. A significant portion of the population (27.07 per cent) is farmers, followed by students (23.06 per cent). The share of Wage Labourers is 8.27 per cent, while Business Owners accounts for just one per cent. Out of the total sample population, Government employees constitute 0.25 per cent; Private Employees 1.50 per cent and about 10.78 per cent of the sample population in the working age group are found to be Unemployed.

As observed, a majority (35 per cent) of the sample HHs earn up to Rs.40,000/- annually, followed by 31.25 per cent earn between Rs.80,001/- to Rs.1,20,000/- rupees, 16.25 per cent earns more than Rs.2,00,001 rupees annually. While 12.5 per cent of them earns between Rs.40001/- to Rs.80,000/- per year; 3.75 per cent of them earn between Rs.120001/- to Rs.160000/- per year while about 1.25 of them earn between Rs.160,001/- to Rs.2,00,2000/- per year. A significant observation is that all of the sample households have *Semi-Pucca* houses. S far as their land is concerned, out of the total sample HH, 45 per cent have between 2 to 5 acres of land; 22.5 per cent have less than 2 acres of land, and 21.25 per cent of them have more than 5 acres to 10 acres of land. The most significant finding is that out of the total sample HHs, only 17 per cent HHs utilized their agricultural loan.

From the Baseline, it is found that out of the total 80 sample households; only six samples HHs (7.5 per cent) cultivate millets in the year 2022 and each of the total 80 sample HH cultivates Paddy. Total operational area among the sample households in the Chandahandi block of Nabarangpur district is 408 acres, of which 290.5 acres (71.20 per cent) is under paddy cultivation, and only 8.5 acre (2.08 per cent) is under millets cultivation. The average yield of millets production among the sample households was 1.56 quintals per acre. The total millets production of sample households was 12.5 quintals. All samples HH cultivate only in Kharif season, more than 80 per cent of them cultivate millets in slope land, and rest of them cultivate millets in middle land. All the millets cultivating households use their own local seeds. Out of them, 83.33 per cent are satisfied with the quality seeds they used. The rest of the 16.67 per cent households reported average quality of seeds. The most common method of millets cultivation among the sample households is broadcasting, which are being in use by 83.33 per cent of households. Line Sowing methods used by only 16.67 per cent of households.

Out of the total six millets cultivating HHs, 83.33 per cent HHs use organic manure as fertilizer, and only 16.67 per cent, use both the fertilizer viz., organic, and chemical manure. Out of the total six millets cultivating HHs, 83.33 per cent HHs use bio-pesticide, and only 16.67 per cent use both bio-pesticide and chemical pesticide and do follow mono farming system. All the millets cultivating sample households are storing their millets seed in jute bag and do their weeding manually. In addition to that, it is also found that out of the non-millets cultivating sample HHs – due to ‘not profitable’ (83.78 per cent), shortage of land (5.40 per cent), another 10.81 per cent revealed that it is no assured market (other reason). The most striking feature is that of the total 80 HHs, the maximum (93.75 per cent) consumes millets in different seasons and at different meals of the day. Consumption of millets is highest (100 per cent) during the summer season and most of them consume it due to heat weaves, while 14.67 per cent of them consume during winter season, and another 5.33 of during the rainy season.

The Baseline Survey also indicates that the majority (93.75 per cent) of them consume millets during their lunch, while about 53.33 per cent breakfast and evening snacks. *Jau/Torani* is the most popular millets recipe in the study area as it consumed by 97.33 per cent of the millets consuming sample households, followed by *Pitha/Tampo* (82.66 percent), and Khiri (78.66 per cent). That out of the total sample HHs only 9.25 per cent are processing their millets by adopting traditional methods. Out of the total millets cultivating sample HHs, the majority (66.67 per cent) sell their millets in daily market. Moreover, as observed, even less farmers are cultivating millets but a higher number are consuming millet based food items. Full scale implementation of the SAA may help them to adopt millets as a staple food.

CONTENTS

SL NO.	TITLE	PAGE NO.
	Foreword	i
	Acknowledgments	ii
	Executive Summery	iii-iv
	Contents	v-vi
	List of Tables	vii
	List of Figures	viii
	Abbreviations	ix
CHAPTER I: INTRODUCTION		1-10
1.1	Background	1
1.2	District Profile	2
1.3	Objectives	7
1.4	Methodology	7
1.5	Limitations	8
1.6	Chapters	9
CHAPTER II: SOCIO-ECONOMIC PROFILE		11-16
2.1	Introduction	11
2.2	Social and Demographic Profile	11
2.3	Social Compositions	11
2.4	Distribution of population by their Sex	12
2.5	Type of Family	12
2.6	Marital Status	12
2.7	Age wise distribution	12
2.8	Religion of Respondent HHs	13
2.9	Education	13
2.10	Ration Card Status	14
2.11	Type of House	14
2.12	Occupations	14
2.13	Annual Income	15
2.14	Land Ownership	15
2.15	Agricultural Credit	16
2.16	Conclusion	16
CHAPTER III: PRODUCTION OF MILLETS		17-22
3.1	Introduction	17
3.2	Cropping Pattern among the Sample HHs	17
3.3	Area, Production and Yield	17
3.4	Sample HHs by their Annual Expenditure under Different Crops	18
3.5	Area, Production and Yield under Millets	18
3.6	Millets Cultivation and Types of Land	18
3.7	Sources of seed	19
3.8	Perception on the Quality of the Seeds being Used	19
3.9	Package of Practices among the Sample HHs	19

3.10	Use of Fertilisers and Pesticides by the Sample HHs	20
3.11	Type of Farming by the Sample HHs	21
3.12	Storage of Seeds by the Sample HHs	21
3.13	Weeding by the Sample HHs	21
3.14	Reason for not Cultivating Millets	21
3.15	Conclusion	22
CHAPTER IV: CONSUMPTION OF MILLETS		23-25
4.1	Introduction	23
4.2	Status of Millet Consumption	23
4.3	Millet Consumption by the Sample HHs across their Age Group	23
4.4	Millets Consumption by the Sample HHs in different Meals of the Day	24
4.5	Millets Consumption by the Sample HHs across Seasons	24
4.6	Consumption of Different Millets Recipes	25
4.7	Conclusion	25
CHAPTER V: PROCESSING AND MARKETING OF MILLETS		26-28
5.1	Introduction	26
5.2	Processing of Millets	26
5.3	Methods of Processing Millets	27
5.4	Selling of Millets by the Sample HHs	27
5.5	Conclusion	28
Annexure1: Mapping of the Baseline Survey		29
Annexure 2: HH Interview Schedule		30-35

LIST OF TABLES		
SL. NO	TITLE	PAGE NO.
Table 1.1	Key Indicators of Nabarangpur District	6
Table 1.2	Sample Households in Nabarangpur District	8
Table 2.1	Distribution of Sample HHs by their Type of Family	12
Table 2.2	Marital Status of the Sample Households	12
Table 2.3	Distribution of Sample Population by their Age Group	13
Table 2.4	Distribution of Sample Population by their Education	13
Table 2.5	Distribution of Sample Population by their Occupation	14
Table 2.6	Distribution of Sample HHs by their Annual Income	15
Table 2.7	Distribution Sample HHs by their Land Ownership	16
Table 3.1	Distribution of Sample HHs by their Operational Landholding	17
Table 3.2	Sample HHs by their Area under Millets & Other Crops	17
Table 3.3	Average Expenditure of Sample HHs under Different Crops	18
Table 3.4	Sample HHs by their Area, Production and Yield under Millets	18
Table 3.5	Sample Millets Cultivating HHs by their Types of Land they Use	19
Table 3.6	Distribution Millets Cultivating HHs by Package of Practices they Follow	20
Table 3.7	Millets Cultivating Sample HHs by the Pesticides they Use	20
Table 3.8	Distribution of Sample HHs by their Reasons of Not Cultivating Millets	21
Table 4.1	Distributions Sample Population by their Millets Consumption	23
Table 4.2	Millets Consumption by the Sample HHs in different meals of the day	24
Table 4.3	Sample HHs by their Millets Consumption across the Seasons	24
Table 4.4	Sample HHs by their Millets Recipes they Prepare and Consume	25
Table 5.1	Distribution of Sample HHs by their Millets Processing Status	26
Table 5.2	Distribution of Sample HHs by their Methods of Millets Processing	27
Table 5.3	Distribution of HHs by Millets Selling Status	27

LIST OF FIGURES		
SL.NO	TITLE	PAGE NO.
Fig. 1.1	Map of Nabarangpur District	10
Fig. 2.1	Distribution of Sample HHs by their Social Category	11
Fig. 2.2	Distribution of Sample Population by their Sex	12
Fig. 2.3	Distribution of Sample Population by their Occupation	14
Fig. 2.4	Distribution of Sample HHs by their Annual Income	15

ABBREVIATIONS

AAO	: Assistant Agriculture Officer
AL	: Agricultural Labour
ATMA	: Agricultural Technology Management Agency
AWC	: Anganwadi Centre
CBOs	: Community Based Organisation
CCD	: Centre for Community Development
CRPs	: Cluster Resource persons
CSOs	: Civil Society Organisations
DAFP	: Directorate of Agriculture and Food Production
DDA	: Deputy Director, Agriculture
FA	: Facilitating Agencies
FGD	: Focused Group Discussion
FPC	: Farmer Producer Company
FPO	: Farmer Producer Organizations
GP	: Gram Panchayat
FAQ	: Fair Average Quality
Ha	: Hectares
HHs	: Households
ICDS	: Integrated Child Development Scheme
ITI	: Industrial Training Institute
LS	: Line Sowing
LT	: Line Transplanting
MDM	: Mid-Day Meal
MFP	: Minor Forest Produce
MGNREGA	: Mahatma Gandhi National Rural Employment Guarantee Act
MGNREGS	: Mahatma Gandhi National Rural Employment Guarantee Scheme
MSP	: Minimum Support Price
NCDS	: Nabakrushna Choudhury Centre for Development Studies
OBC	: Other Backward Classes
SAA	: Shree Anna Abhiyan
PDS	: Public Distribution System
SC	: Scheduled Castes
SMI	: System of Millet Intensification
ST	: Schedule Tribes
WASSAN	: Watershed Support Service and Activities Network

CHAPTER I

INTRODUCTION

1.1 Background

Millets have been a staple food for millions of people in India for centuries., especially in the central tribal belts. They are drought-resistant, highly nutritious, and can be cultivated in a wide range of soil and climatic conditions. Millets are also low in Glycemic Index and gluten-free making them an ideal choice for people with various health conditions. In recent times, there has been a renewed interest in millets cultivation due to its numerous health benefits and its potential to address food security challenges in the country. The Government of India has been promoting the cultivation of millets as part of its efforts to increase farmers' incomes, reduce dependence on water-intensive crops like rice, and promote sustainable agriculture. In this context, it is essential to understand the significance of millets cultivation and its associated challenges and opportunities.

Millets are cereal grain belong to the Poaceae family, commonly known as the grass family. Millets are small, round whole grain grown in India, Nigeria, and other Asian and African countries. It is considered an ancient grain, used both, for human consumption and livestock and bird feed. Millets have multiple advantages over other crops, including drought and pest resistance. It is also able to survive in harsh environments and less fertile soil. These benefits stem from its genetic composition and physical structure — for example, its small size and hardness. This crop is also divided into two categories — major and minor millets, with major millets being the most popular or commonly cultivated varieties. Major millets include Pearl millet, Foxtail millet, Proso millet (or white), Finger millet (or Ragi); Minor millets include Kodo millet, Barnyard millet, little millet, Guinea millet, Brown Top millet, Fonio millet, Adlay (or Job's tears). Like most cereals, millets are starchy grains — meaning that it's rich in Carbs. Notably, it also packs several vitamins and minerals. Therefore, it may offer multiple health benefits.

The United Nations designating 2023 as the International Year of Millets, it gets further attentions of public including the farmers. In the Indian state of Odisha, millets have always been an integral part of the traditional diet and have been cultivated for centuries, primarily among the tribal population. However, during last couple of decades, the popularity of millets has declined due to the increasing adoption of modern food habits and the promotion of high-yielding crops like rice and wheat. This shift has led to a decline in soil fertility and an increased vulnerability to climate change. To address these challenges, the Government of Odisha has launched several initiatives to promote the cultivation of millets, including 'The Special Programme for Promotion of Millets in Odisha' (also known as Shree Anna

Abhiyan, SAA) with a novel organisational structure was initiated by the Government of Odisha in 2017-18 emphasising production, consumption, processing, and marketing of millets. The program aims to increase production, consumption, processing, and marketing of millets in tribal areas, where they have been a staple food for generations. In this context, it is crucial to understand the significance of millets cultivation in Odisha and its potential to promote sustainable agriculture and improve food security. Among other Millets found in Odisha, Mandia constitutes a significant share of about 95 per cent.

The Millet Mission program tried to revive these nutrient-rich millets in the agricultural landscape, which were fading away after its launch in 2017-18 by the Government of Odisha. It aimed to promote the production, consumption, processing, and marketing of millets, with a particular focus on tribal areas. The program had a unique structure that emphasized cultivating traditional millets such as Ragi, Gurji, Kosla (small millet), Kodo, Kangu (foxtail millet), and Jowars, which were forest dwellers' age-old foods. This initiative gave millet crops the much-needed attention they deserved and revived their growth across the state. In 2022, the implementation of SAA, Phase VI began in 17 districts, including Nabarangpur district, and this baseline study aims to provide information on the program's dimensions in the district. The profile of the Nabarangpur district is present below.

1.2 District Profile

Nabarangpur district, situated in the lush green forests of southwestern Odisha, is a picturesque district that was established on October 2, 1992, as per State Government Notification No. DRC(44/93/14218/R). Prior to that, it was a sub-division of the undivided Koraput district. The district shares its boundaries with Raipur and Bastar districts of Chhattisgarh in the north and west, Kalahandi and Rayagada districts in the east, and Koraput district in the south. The district covers an area of 5,294 sq. km, with vast forest coverage of 1583.4 sq. km. It lies between 20.3 to 17.5 degrees North latitude and 81.27 to 84.1 East longitudes.

Nabarangpur town is the administrative headquarters of the district. The district comprises one sub-division (Nabarangpur), 10 Tehsils and 10 blocks. As per the 2011 Census, the district has a population of 1,220,946, with more than ten types of tribes accounting for half of the population. The sex ratio of the district is 1018. The tribes of Nabarangpur district mainly depend on agriculture and forest products for their livelihood.

1.2.1 Geography and Topography:

Nabarangpur district, also known as Nabarangpur, is situated at 19.14' latitude and 82.32' longitude, with an average elevation of 572 metres (1,877 ft). The district is primarily a flat forest plateau with

dense forest coverage in the north and east. In the western part of the district, some low hills rise to 1000 metres. The southern area of the district is characterized by the plains of the Indrāvati River, which forms a significant part of the border with Koraput district. The easternmost boundary, which is close to Rayagada, lies in the Eastern Ghats. In the northeast of the district, there is a region named Panabeda Mutta around Chandahandi, situated around 150 metres above sea level. Nabarangpur district shares its borders with Kalahandi and Koraput districts in Odisha and Raipur districts in the north, and Dhamtari and Bastar districts in the west of the neighbouring state of Chhattisgarh.

1.2.2 Economy

The majority of people in Nabarangpur depend on agriculture for their livelihood, and 40 per cent of the total land in the district is under cultivation. This district is predominantly an agricultural area, with more than 90 per cent of its inhabitants relying on farming. However, the farming community largely depends on rainfall due to the lack of irrigation facilities. To improve the cultivation of fruits and vegetables, the National Horticulture Mission is taking various steps in the district.

In addition to agriculture, some industries have been established in recent years. Nabarangpur district is rich in natural resources such as iron, chlorite, mica, and quartz. The village of Heeraput near Umerkote has a considerable deposit of hematite and limonite, each containing approximately 60 per cent iron. Similarly, the Tentulikhunti area of Nabarangpur has large deposits of granite. The north of Nabarangpur district, up to the border of Kalahandi, has rock beds covering layers of coarse white quartz. Although industrial penetration in Nabarangpur district is limited, these minerals found in the district sustain various industries in other parts of the country. It's worth noting that although the economy of Nabarangpur is primarily focused on agriculture, the district has huge potential for the growth of other industries, especially in the mining sector.

1.2.3 People and Culture

According to the 2011 census, the total population of Nabarangpur district was 1,220,946, with 1,133,321 living in rural areas and 87,625 in urban areas. Scheduled Tribe and Scheduled Caste population comprise 55.80 per cent and 14.50 per cent of the district population, respectively. The Kandha, Paraja, and Soura tribes mainly inhabit the district. The population density is 231 people per sq.km with a decadal growth rate of 18.81 per cent, compared to the state's population density of 270 people per sq.km and decadal growth rate of 14.0 per cent. The district has 891 census villages (including 23 uninhabited villages) spread across 10 Blocks and 10 Tehsils. The literacy rate in the district is 46.4 per cent, compared to the state's rate of 72.9 per cent. The level of urbanisation is 7.18 per cent of the total district population, compared to the state's level of 0.21 per cent. As per the 2011 census, the most

spoken language in the district was Odia, with 68.64 per cent of the population speaking it. Other languages spoken in the district include Bhatari, Gondi, Bengali, Chhattisgarhi, Desia, Halbi, Kui and Kuvi. Major Odia dialects of the region include Desia and Bhatari. In addition, the language of Chhattisgarh in the west influences the border area of the district.

Nabarangpur district, with its 885 villages and 169 Gram Panchayats, is a composite of various religions, with a majority of Hindus, followed by Christians and Muslims. The tribal population, which constitutes half of the district's population, worships Hindu gods, while other tribes like Bhumias and Dombs also reside here. Mirganis, Sankharis, Malis, and Sundhis are some of the tribes found in the district. However, the district has a relatively low literacy rate, with only 38.53 per cent of the population being literate. The district has several educational institutions, including a Women's ITI, Umerkote; Govt. Secondary Training School in Nabarangpur, and Govt. Secondary Training School in Umerkote, to cater to the educational needs of the people.

The district is well known for its tribal culture, with some of the largest tribes being the Bhattadas and Gonds. Each of these tribes has their language, customs, and folk dances, although they all understand and speak Odia. The Chherchhera dance is well known among the Bhattadas. The tribals in the district still follow their traditional religion, although it has been heavily influenced by Hindu customs. Generally, the tribes have certain similarities, such as totemistic clans, similar settlement patterns, and the usage of Mahua. Some major festivals unique to the tribals of Nabarangpur include *Pus Parab (Pousha Parba)*, *Magha Parab*, and *Chaitra Parab*.

The Mondei festival is one of the most widely celebrated festivals in the district, and it marks the end of the harvest season. The district experiences rainfall much earlier than the rest of the state due to its location, receiving rain directly from the Arabian Sea through the Southwest direction. The district enjoys a total annual rainfall of 16912.57 mm, with the plateau areas remaining cool throughout the year, located between 2,000 and 3,000 feet. The district's diverse religious and cultural background is reflected in its various festivals and traditions. Along with Mondei, other popular festivals celebrated in Nabarangpur include Dussehra, Diwali, Holi, and Christmas. The district is also known for its unique handicrafts, such as bamboo craft, terracotta, and stone carving.

1.2.4 Administration

Nabarangpur town serves as the administrative headquarters of Nabarangpur district, encompassing one Sub-division, 10 Tehsils, and 10 blocks. According to the provisional 2011 Census, the district has a population of 1,220,946, with over 10 different tribes making up half of the population. The sex ratio of

the district is 1018, and the tribes predominantly rely on cultivation and forest products for their livelihoods. The language of Chhattisgarh influences the border area of the district to the west.

There are 885 villages in Nabarangpur district, which fall under 169 Gram Panchayats, one Notified Area Council, Umerkote, and 10 Police Stations. The district's religious makeup is diverse, with Hindus, Christians, and Muslims making up a significant portion of the population and tribal communities who worship Hindu gods. Bhumias, Dombs, Mirganis, Sankharis, Malis, and Sundhis are some of the tribes residing in the district, with the Mirganis considered a sub-caste of the Dombs. The literacy rate in the tribal-dominated district of Nabarangpur is relatively low, with 490,156 literates constituting 38.53 of the population. Of these, 298,688 are male, and 191,468 are female, representing 61.01 and 38.9, respectively. Despite this, there are several educational institutions in the district, including Women ITI, Umerkote; Govt. Secondary Training School in Nabarangpur and Umerkote, and Jawahar Navodaya Vidyalaya in Khatiguda, which is a Central Government-run special school that serves the educational needs of the district.

Table 1.1: Key Indicators of Nabarangpur District	
Indicators	Value
Population (in Lakh.) (as per Census 2011)	12.20
Male (in Lakh.)	6.00
Female (in Lakh.)	6.20
Scheduled Castes (in Lakh.)	1.80
Scheduled Tribes (in Lakh.)	6.80
Others (in Lakh .)	3.60
Total Households (in Lakh.)	2.70
Average HH Size (in Nos.)	4.50
Sex Ratio	1019
Workers	
Total Worker (in Lakh)	6.10
Main (in Lakh)	2.80
Marginal (in Lakh)	3.30
Non-Worker (in Lakh)	6.10
Work Participation Rate (WPR)	50.03
Literacy Rate	46.40
Land Use Pattern 2018-19 (Area in Hectares)	
Total Geographical Area (sq.km.)	5294.00
Forest (sq. km.)	1583.40
Land Put to Non-Agricultural Use	31408
Barren & Non-Cultivable Land	13158
Permanent Pasture& Other Agricultural Land	17719
Net Area Sown	151826
Cultivable waste Land	16765
Old Fallow	20694
Current Fallows	32347
Misc. Trees and Groves	27147
Average Fertilizer Consumption per ha (in kg/ha)	151.03
Agriculture 2018-19*	
Total Production of Major Crops (In '000MT)	777.70
Total Ragi Production (in '000 MT)	1.80
Irrigation Potential Created – 2017-18* (Area in '000 Hectares)	
Kharif	54.40
Rabi	34.18
Other Information	
No. of Village Electrified (as on 31.03.21)	820
No. of AWC	2221
No. of PDS centres (2011)	84
No. of Job Card Issued (since inception in Lakh)	2.38
No. of HH demanded employment under MGNREGA during 2017-18 (in Lakh)	0.98
No. of HH provided employment under MGNREGA during 2017- 18 (in Lakh)	0.92
Kisan Credit Card (Households)	102625
<i>Source: District Statistical Handbook, Nabarangpur 2018</i>	

1.3 Objectives

The Baseline Survey 2023 intended to collect primary data from the millets farming households at the village level on the current practices on cultivation, including production, consumption, processing, and marketing. The collected information would provide background information for planning and implementing the programme as well as it will be useful for evaluation of the programme in the future. The objectives of the Baseline Study are as follows:

- To assess the socio-economic condition of the HHs.
- To outline millet production, productivity, and package of practices.
- To examine the consumption pattern of millets and
- To elucidate the processing and the mode of marketing of millets

1.4 Methodology

1.4.1 Sample Design

In phased manner, the SAA programme is implemented, which started with 7 districts of the state in Phase I during 2017-18 however, later it has expanded to all 30 districts in different phases. Under Phase VII of the implementation of the programme, the Government of Odisha's Department of Agriculture and Farmers Empowerment introduced the "Special Programme for Promotion of Millets in Odisha" included an additional 58 blocks across 17 districts of the state including one block of Nabarangpur, namely, Chandahandi. From the list provided by the SAA Programme Secretariat, there were 417 beneficiary households in 26 villages under six Gram Panchayats covering one block in the Nabarangpur district. For conducting the Baseline Survey 2022, under Phase VII, a multi-stage sampling method is followed. In the first stage, one block, namely, Chandahandi is purposively selected for the study as SAA is going to implement in the block in Phase VII.

As proposed, the SAA programme is going to be implemented in six GPs of Chandahandi Block in the second stage, two GPs from the block have been selected for the study in consultation with the respective facilitating agencies (FAs) and district level officials of the agriculture department. Dalabeda and Malegaon GPs from the block have been selected for the study. In the third stage, two villages from each GP have been randomly selected for the study and in the final stage, 20 households from each village have been randomly selected for the study. Therefore, as a total of 80 sample households from four villages, covering two GPs under one block have been selected for the study.

Table 1.2: Sample HHs in Chandahandi Block of Nabarangpur District			
Block	Programme Households (N)	Sample Households (N)	% HHs Covered under the Survey
Chandahandi	417	80	19.18

Source: Facilitating Agency and Field Survey, 2023

1.4.2 Data Collection, Compilation and Analysis

This comprehensive baseline survey report is based on both secondary and primary data. Primary data was collected by using a structured household interview schedule (Annexure II) from the concerned villages of the districts. Additionally, secondary data on geographical information, population, agriculture, education, irrigation, forest, and institutions were collected from various published and unpublished sources, including the 2011 Census reports, Odisha Agricultural Statistics, and so on. The Baseline Survey aimed to collect data on various socio-economic indicators such as household demographics, income, livelihoods, education, economic activities, annual income, and so on. The report provides an in-depth analysis of the current situation in the selected villages and serves as a reference point to measure the progress to be made during the implementation of various development interventions in the future. It also highlights the gaps and challenges in the existing systems and infrastructure. It provides recommendations for improving the overall development indicators of the region.

1.5 Limitations of the Study

The present Baseline Survey Phase VII focuses solely on one block namely Chandahandi of the Nabarangpur district. However, due to the onset of the harvesting season, coupled with both in and out-migration, some household heads and female respondents were found to be absent during the data collection process. Despite these challenges, it is important to acknowledge the limitations of the present study.

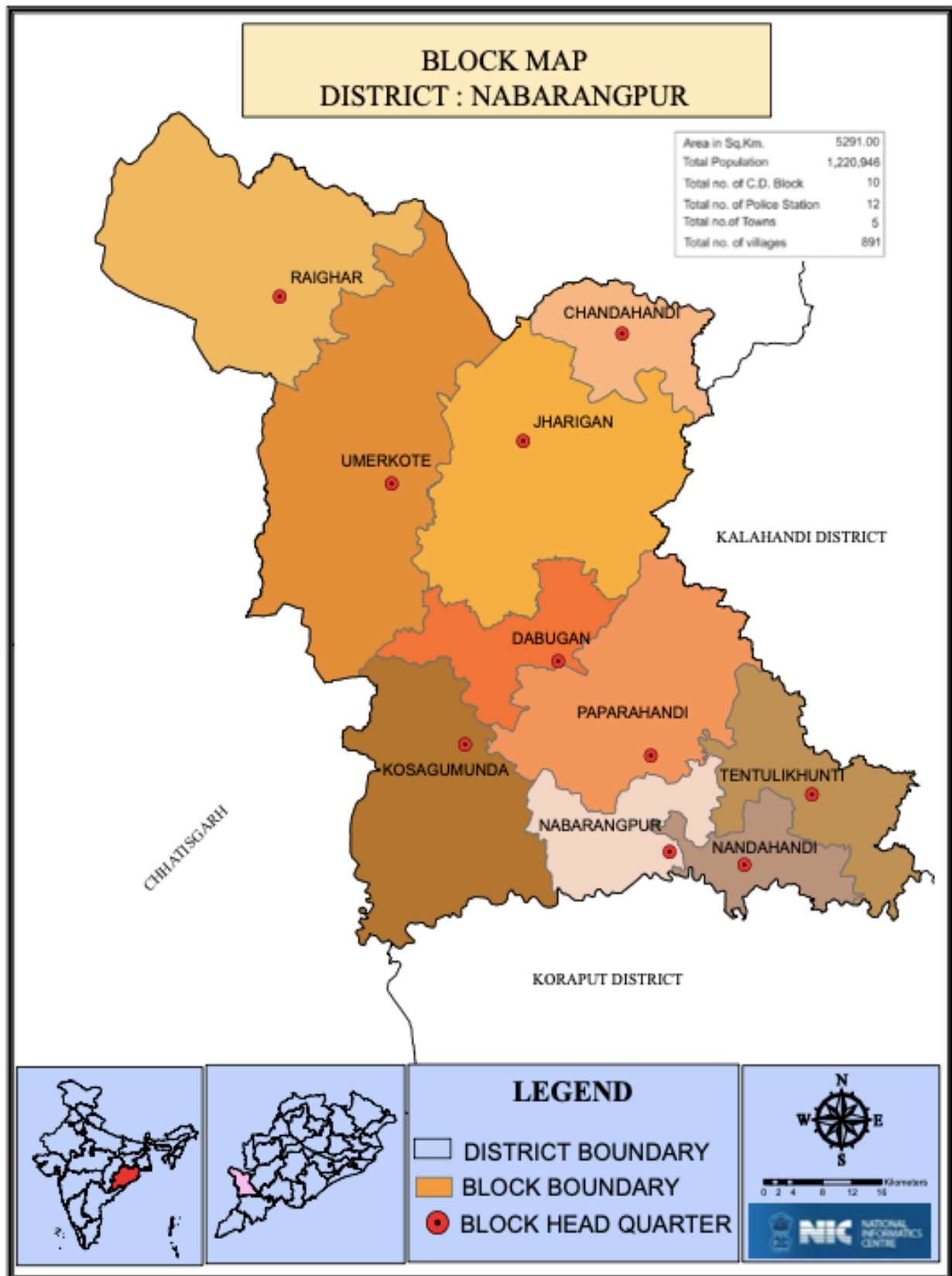
Firstly, due to logistical reasons and other difficulties, such as the non-availability of respondents, the study was limited to a random sample of 160 households. Secondly, there is the possibility of recall error, especially in cases involving the actual quantity of consumption and marketing, among others. Lastly, in some instances, sample households, particularly non-participant farmer households, consumed millets without producing them. This was made possible by past stock and acquiring of millets through exchange and barter, unfortunately, these details could not be captured during the survey.

It is essential to consider these limitations while interpreting the findings of the survey. Future studies can address these gaps and improve the accuracy of the data collection process. Despite these limitations, the present survey provides valuable insights into the socio-economic conditions of the selected households and serves as a baseline to measure the progress made in the future.

1.6 Chapters

The Baseline Survey Report 2023, Phase VII, has been divided into six chapters, including the current introductory Chapter I, which provided a district Profile, Objectives, Methodology and Limitations. Chapter II provides the Socio-economic profile of the sample Households. Chapter III provides details on the production and productivity of millets. Chapter IV discusses the consumption pattern of millets. Chapter V elucidates the Processing and Marketing of millets.

Fig.1.1: Map of Nabarangpur District



Source: Nabarangpur District Website

CHAPTER II

SOCIO-ECONOMIC PROFILE

2.1 Introduction

This chapter looks into the social and demographic profile of households surveyed under Baseline Survey 2023, Phase VI, which includes the distribution of sample households by their social groups, and the distribution of the population by gender as well the distribution of population by their education status, and age distribution in the Chandahandi block of Nabarangpur district. It also provides information about the distribution of households by their religion. It also provides information regarding occupational distribution of population among the sample households with annual income. Additionally, also provides information about possession of ration card by the sample households and distribution households by their house structure.

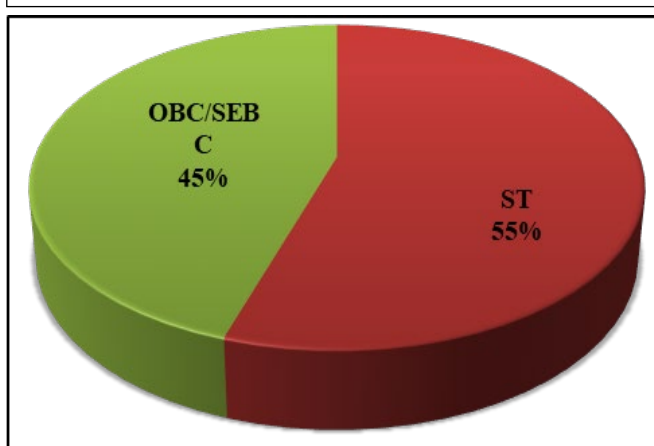
2.2 Social and Demographic Profile

Under the Baseline Survey 2023, Phase VII in Nabarangpur district, four selected villages were surveyed (for Methodology, see Section 1.4.1) in the Chandahandi block of Nabarangpur district. This section discussed the social composition of the surveyed households', their economic activities, poverty status and housing structures and so on.

2.3 Social Composition

Analysis of social composition of sample households under the Baseline Survey 2023, Phase VII (Fig. 2.1) in Nabarangpur district shows that out of the total 80 sample households a significant majority (44 HHs) belong to Schedule Tribes. This constitutes about 55 per cent of the total sample households, while rest of the 36 households belong to OBC/SEBC community accounting for 45 per cent.

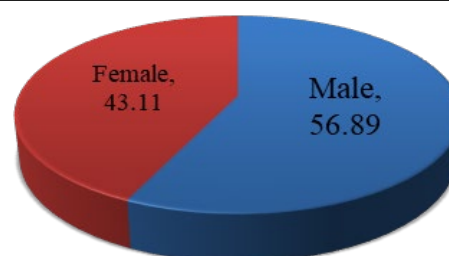
Fig. 2.1: Sample HHs by their Social Category



2.4 Sample HHs by their Sex

The gender distribution of the sample households in the Chandahandi block of the district presents in the Fig 2.2. It reveals that out of the total 399 person among the sample households about 227 of them are male which constitute about 56.89 per cent of the total population of sample households while there are 172 female, which account for 43.11 per cent of them.

Fig. 2.2: Sample Population by their Sex



2.5 Sample HHs by their Type of Family

Table 2.1 presents the type of family of the sample households in the Chandahandi block - 100 per cent belong to nuclear family. No other such as Joint family, or Extended family is not found in the sample households in the Block.

Table 2.1: Sample HHs by their Type of Family

Family Type	N	%
Nuclear	80	100

Source: Baseline Survey, 2023

2.6 Marital Status

Table 2.2 presents the marital status of the total population of the sample households in the Chandahandi block. Out of the total 399 populations from 80 samples HHs, it is observed that more than 53 % populations are married and 44 are unmarried in the block. It is also found that there are two per cent population is widow and one per cent population is widower.

Table 2.2 Marital Status of Households

Marital Status	N	%
Married	213	53.38
Unmarried	176	44.11
Widow	6	1.50
Widower	4	1.00
Total	399	100

Source: Field Survey 2023

2.7 Distribution of Sample Population by their Age Group

The distribution of population among the sample households, which shows that majority (48.12 per cent) of population are adults, followed by middle aged (21.05 per cent), adolescent (10.28 per cent), and old (8.02 per cent), while Child (7.27 per cent), Pre-school children (4.01 per cent) and Infant (1.25 per cent). (Table 2.3)

Table 2.3: Sample Population by their Age Group		
Age Group	N	%
Infant (0-2 year)	5	1.25
Preschool (3-5 year)	16	4.01
Children (6-12 year)	29	7.27
Adolescent (13-18 year)	41	10.28
Adults (19-44 year)	192	48.12
Middle Age (45-59 Years)	84	21.05
Old (60 and above)	32	8.02
Total	399	100
Source: Baseline Survey, 2023		

2.8 Distribution of the Sample Population by their Religion

All the sample households of both the GPs in the Chandahandi blocks of the district belong to Hindu religion.

2.9 Sample Population by their Education

Table 2.4 and present the distribution of educational qualification of population of the sample households in the Chandahandi block of the district. There are 399 populations from 80 households in the block. It shows that majority (36.34 per cent) of them have completed education.

Table 2.4 Sample Population by their Education			
Sl no	Category	N	%
1	Illiterate	81	20.30
2	Up to class 5	113	28.32
3	Class 6-10	145	36.34
4	Higher Secondary	32	8.02
5	Graduation	8	2.01
6	Post-Graduate	0	0.00
7	Technical	7	1.75
8	Professional	0	0.00
9	Any others	13	3.26
10	Total	399	100
Source: Field Survey 2023			

between 6 to 10 classes, followed up to class five (28.32 per cent), and higher secondary (8.02 per cent). The share of graduate is 2.01 per cent, about 1.75 per cent of them have technical education and about 3.26 per cent have other educational qualification including management and professional, while rest of the 20.30 per cent of them are illiterate.

2.10 Possession of Ration Card

All the sample households in the study area, i.e., Chandahandi block of the district possesses ration card.

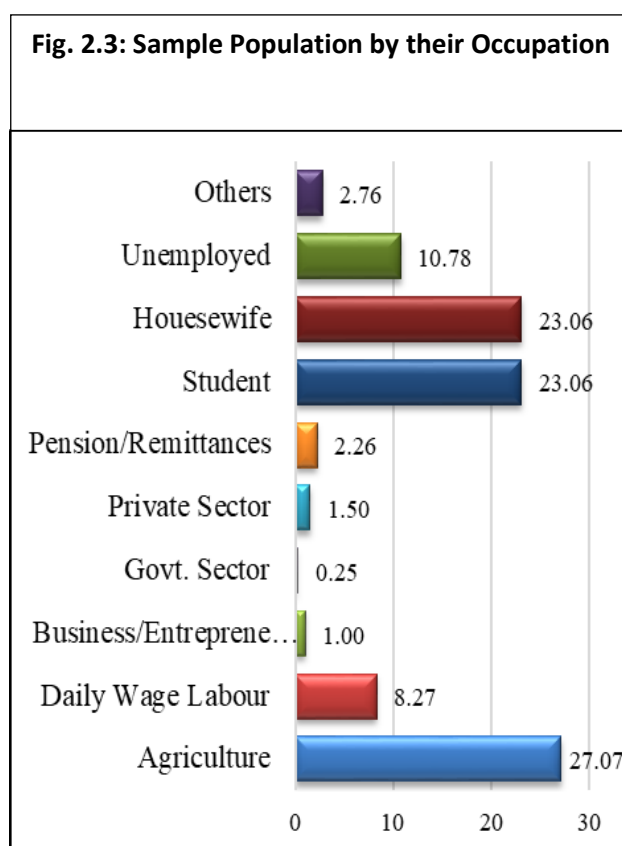
2.11 House Structure of the Surveyed HHs

All the sample households in the study area, i.e., Chandahandi blocks of the district have Semi-Pucca house structure

2.12 Occupation

Table 2.5 and Fig. 2.3 shows the distribution of economic activities and population across villages in the sample households in the Chandahandi block. It shows that out of the total population of 399 persons, 27.07 per cent are engaged in agriculture as their primary Occupation, followed by students

Table 2.5: Sample Population by their Occupation		
Block: Chandahandi		
Occupation	N	%
Agriculture	108	27.07
Daily Wage Labour	33	8.27
Business/Entrepreneurship	4	1.00
Govt. Sector	1	0.25
Private Sector	6	1.50
Pension/Remittances	9	2.26
Student	92	23.06
Housewife	92	23.06
Unemployed	43	10.78
Others	11	2.76
Total	399	100.00
<i>Source: Field Survey 2023</i>		

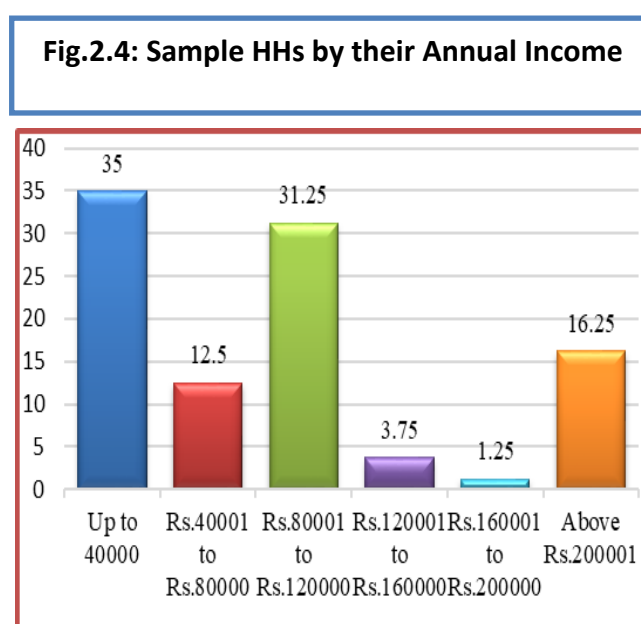


and housewife 23.06 per cent each. While 8.27 per cent of them worked as wage labourers, and there is only one percent of population are business owners. The share government employees and private employees constitute about 0.25 per cent and 1.50 per cent, the pension holders, and population with other occupations constitute about 2.26 per cent each. Another 2.76 per cent of them are children while rest of the 10.78 per cent of them population belongs to working age group are unemployed.

2.13 Annual Income

Table 2.6 and Fig. 2.4 represent the distribution of annual income of the sample households. The annual income of households, categorized in six income groups. It shows that majority (35 per cent) of the sample households earns up to Rs.40,000 rupees annually. It is followed by 31.25 per cent between Rs 80,001 to Rs 1,20,000 rupees, 16.25 per cent earns more than Rs.2,00,000 rupees and 12.5 per cent earns between Rs.40,001 to Rs.80,000 rupees whereas five per earns between Rs.1,20,001 to Rs 2,00,000 rupees.

Table 2.6: Sample HHs by their Annual Income		
Income Category	N	%
Up to Rs.40000/-	28	35
Rs.40001 to Rs.80000/-	10	12.5
Rs.80001 to Rs.120000/-	25	31.25
Rs.120001 to Rs.160000/-	3	3.75
Rs.160001 to Rs.200000/-	1	1.25
Above Rs.200001/-	13	16.25
Total	80	100
Source: Baseline Survey 2023		



2.14 Land Ownership Pattern

Table 2.7 presents the distribution of sample households by the size of their landownership. It shows majority (45 per cent) of them owns between 2 to 5 acres of land, about 22.5 per cent owns less than 2 acres, 21.25 per cent owns between 5 to 10 acres, while about 11.25 per cent owns more than ten acres of land.

Table 2.7: Sample HHs by their Land Ownership		
Category	N	%
No Land	0	0
Less than 2 Acre	18	22.5
More than 2 to 5 Acre	36	45
More than 5 to 10 Acre	17	21.25
More than 10 Acre	9	11.25
Total	80	100
<i>Source: Field Survey 2023</i>		

2.15 Sample HHs by their Agricultural Credit

It was found that about 14 samples HHs (17.7 per cent) of them availed loan mainly to fund agricultural operations.

2.16 Conclusion

This chapter has discussed different socio-economic aspects of sample households from Chandahandi block of Nabarangpur district. finding from the study reveals that majority (55 per cent) of the sample households in the block belong to Schedule Tribe constituting while rest of the 45 per cent of them belong to Other Backward. All the sample households are Hindu. Gender distribution of the population among the sample households indicated a positive sex ratio in the region with 56.89per cent female and 43.11per cent male. All the sample households are nuclear family. Majority of the population falls in the age group of adults followed by middle age. Similarly, majority of the population have completed class up to class 5 to class 10. The distribution of economic activities of the sample households reveals that agriculture is the primary occupation for most of the people. Every household has semi-pucca houses, and majority of the sample households earn less than Rs.40000 rupees annually indicating their poor economic condition. However, every household does have land, but majority of the sample households possesses between two acres to five acres of lan

CHAPTER III

PRODUCTION OF MILLETS

3.1 Introduction

The Baseline Survey 2023 assessed the situation of millets production in the target villages before the implementation of the programme interventions. This chapter analyses the data collected from the Chandahandi block of Nabarangpur district. The analysis focuses on the distribution of area under millets and other crops, the usage of seeds and agronomic practices, as well as the production and yield of millets in the sample villages. The chapter also highlights the challenges and opportunities for promoting millets in the district.

3.2 Cropping Pattern

Table 3.1 shows the operational land holding pattern of sample households. It is found that the entire sample household are cultivating paddy while some of them are cultivating other crops along with it. It reveals that about 7.50 per cent of them are cultivating millets, 2.50 per cent of them are cultivating vegetables while a significant portion (67.50 per cent) of them cultivating others crops including maize, cashew, and lemon.

Table 3.1: Sample HHs by their Operational Landholding

Crops	N	%
Paddy	80	100
Millets	6	7.50
Vegetables	2	2.50
Others	54	67.50

Source: Baseline Survey, 2023

3.3 Area, Production and Yield

It is revealed that a significant share (71.20 per cent) of agricultural land used for paddy cultivation, while only 2.08 per cent used for millets cultivation. Further, about 25.98 per cent of total agricultural land area is used for cultivation of other crops such as maze, sunflower, cashew and lemon tree and rest of the 0.74 per cent of used for vegetables cultivation.

Table 3.2: Area under Millets & Other Crops

Crop	Area (acre)	%
Paddy	290.5	71.20
Millets	8.5	2.08
Vegetables	3	0.74
Others	106	25.98
Total	408	100

Source: Baseline Survey, 2023

3.4 Sample HHs by their Average Expenditure under Different Crops

Table 3.3 presents the distribution of average expenditure for different crops. It shows that the average expenditure in paddy is Rs.10908 rupees per acre. The average expenditure per acre for millets cultivation is Rs.11059. For other crops such as Cashew, lemon etc., the expenditure is Rs.8108 whereas no expenditure is reported under vegetable cultivation.

Table 3.3: Average Expenditure under Different Crops (in Rs.)			
Crops	HHs	Area	Expenditure/Acre
Paddy	80	290.5	10908
Millets	6	8.5	11059
Vegetables	2	3	0
Others	54	106	8108
Source: Field Survey, 2023			

3.5 Area, Production and Yield

Table 3.4 the area, production, and yields of millets. It is found that they cultivate *Mandia* during the summer season only in 8 acres of land. Moreover, as revealed in the Baseline Survey that the total millets production among the millets cultivating sample households is found to be 12.5 quintals during the Kharif season. It is also observed under the Baseline Survey that the yield rate of *Mandia* is 1.56 quintal in the Chandahandi block.

Table 3.4: Area, Production and Yield of Mandia	
Crops	Value
Area (in Acre)	8
Production (in Qtls.)	12.5
Yield (Qnt. / Acre)	1.56
Source: Field Survey, 2023	

3.6 Millets Cultivation and Types of Land

Generally, millets are cultivated in less fertile, high or sloppy lands as it known for its' low water footprint, it requires less water, moderate temperature, and an adequate amount of sunlight. Table 3.5 shows that majority (83.33 per cent) of them cultivate millets in slope land while only 16.67 per cent of them cultivate in the middle land.

Table 3.5: Millet cultivating Sample HHs by their Type of Land								
Type of Land	Kharif		Rabi		Summer		Total	
	N	%	N	%	N	%	N	%
Upper	0	0	0	0	0	0	0	0
Slope	5	83.33	0	0	0	0	5	83.33
Middle	1	16.67	0	0	0	0	1	16.67
Low	0	0	0	0	0	0	0	0
Total	6	100	0	0	0	0	6	100
Source: Field Survey, 2023								

3.7 Sources of Seeds

Good quality of seeds is crucial for the production and yield of millets. As found in Chandahandi block of the district, all six samples HHs used local variety millets seed for cultivation.

3.8 Perception on Quality of the Seeds

Quality of seeds also determined the health of the crops, its productivity and yield of the crops. Therefore, it is crucial to find out the quality of the seeds being used by the sample millet farmers. As revealed five sample HHs (83.33 per cent) used good quality and another one HHs (16.67 per cent) reported that they are using average quality of seeds.

3.9 Package of Practices

In agriculture, the methods of cultivation play a vital role in the growth and production of crops. Therefore, different agronomic practices being followed by the farmers suited to their land and socio-economic conditions. As revealed (Table 3.6) the millets cultivating sample households by the agronomic practices they follow for millets cultivation in the Chandahandi block of the district. It reveals that majority 5 samples HHs (83.33 per cent) of them are following Broadcasting (BC) methods while only 1 sample HH (16.67 per cent) are following Line Sowing (LS) method for millets cultivation. It is also found that not a single household cultivating in summer and rabi season.

Table 3.6: package of practices

Variety of Practices being used	Kharif		Total	
	N	%	N	%
SMI Method	0	0	0	0
LT Method	0	0	0	0
LS Method	1	16.67	1	16.67
Broadcasting Method	5	83.33	5	83.33
Total	6	100	6	100

Source: Field Survey, 2023

3.10 Use of Fertilisers and Pesticides

Land fertility and pest control are crucial part of the agricultural practice, especially for the growth and production of the crops. Farmers use various methods to increase their fertility and crop protection, these methods are mainly divided in to two categories, viz. Organic and inorganic or (chemical methods). Organic methods of fertilisers include organic manure includes cow dung, goat and sheep manure. Unlike other crops, millets cultivation requires minimum fertilisers input and pest control. Table 3.7 presents distribution of millets cultivating sample households by types of fertilisers and pesticides they use for millets cultivation. It shows that majority 5 Sample HHs (83.33 per cent) of them use organic manure in their millets fields, while only 1 sample HH (16.67 per cent) of them are using both organic manure as well as chemical fertilisers. Similarly, for pest control majority 5 Sample HHs (83.33 per cent) of them use bio-pesticides while only 16.67 per cent of them use both bio-pesticides as well as chemical pesticides.

Table 3.7: Millets Cultivating Sample HHs by their Fertilizer & Pesticides Use

Types	Fertilisers		Types	Pesticides	
	N	%		N	%
Organic Manure	5	83.33	Bio-Pesticides	5	83.33
Chemical Fertilisers	0	0	Chemical Pesticides	0	0
Both	1	16.67	Both	1	16.67
No Use	0		No Use	0	0
Total	6	100	Total	6	100

Source: Field Survey, 2023

3.11 Type of Farming

The distribution of millets cultivating sample households by the type of farming that they adopt i.e., mono farming or mixed farming - it is observed that all the millets cultivating sample households in the study area adopted mono cropping farming system.

3.12 Storage of Seeds

After harvesting of millets, storage and preservation of seeds is very important for any crops. Farmers use different techniques to store their millets seeds such as bag, earthen pot, bamboo basket, Pura (paddy rope) and open hanging. However, as found in the Baseline Survey the distribution of millets cultivating sample households by the methods of millets' seed storage, they use in Chandahandi block of the district. It shows that all of them use (plastic) bag for storing their millets seeds.

3.13 Weeding Practices by the Sample HHs

Like fertilisers and pest control, weeding also crucial for health crop and better production. Millets farmers use different methods for remove weeds from their fields such as manual weeding, using Weeder and both. As found in the Baseline Survey the distribution of millets cultivating sample households by their weeding status and weeding methods, they use in the Chandahandi block of the district. It shows that all of them remove weeds from their millets fields manually.

3.14 Reasons for not Cultivating Millets the Sample HHs

Out of the total sample households only 7.50 per cent of them are cultivating millets while majority (92.50 per cent) of them are not cultivating millets in Chandahandi block of the district (Table 3.8). It presents the distribution of households by the reasons they do not cultivate millets.

Table 3.8: Distribution of Sample HHs by their Reason of Not Cultivating Millets												
Block	Not Profitable		Shortage of Land		Non-Availability of Seed		Lack of Irrigation		Others		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Chandahandi	62	83.78	4	5.40	0	0	0	0	8	10.81	74	100
Source: Field Survey, 2023												

It shows that out of the non-millets cultivating households, majority (83.78 per cent) of them not cultivating millets because it is not profitable. Another 5.40 per cent are cultivating due to shortage

of land for millets cultivation, while about 10.81 per cent of them do not cultivating it for other reasons such as lack awareness and lack of market for millets cultivation.

3.15 Conclusion

Being a tribal populated district, millets have been an integral part of the food habit of people in Nabarangpur. However, in Chandahandi block, very few farmers cultivate millets. It is found that only 7.5 per cent sample households cultivate millets covering only around 2.08 per cent (8.5 acre) of agricultural land. All of them use own seeds for millets cultivation and are satisfied with the quality of seeds they use. The most common agronomic practice in millets cultivation is broadcasting. As per the pattern of fertilisers and pesticides, use is concern, most farmers use organic or bio fertilizers organic pesticides. While non-profitability is the primary reasons for not cultivating millets among the non-millets cultivating sample households.

CHAPTER IV

CONSUMPTION OF MILLETS

4.1 Introduction

Baseline Survey 2023 was conducted to assess the trend and patterns of millets consumption among other objectives in the target areas before implementing the programme in the Chandahandi block of Nabarangpur district. The main objective of this chapter is to analyse trends and patterns of millets consumption among the sample households in the Chandahandi block of the district. The chapter also explores the types of millet varieties, recipes and dishes that are consumed by the sample households and how they prepare them. In doing so, the chapter aims to provide a comprehensive picture about the patterns of millets consumption and preferences among the sample households in Nabarangpur district, which is one of the focus areas of SAA.

4.2 Status of Millets Consumption

It is found that out of the total sample households' majority 75 sample HHs (93.75 per cent) of them are consuming millets while only 5 sample HHs (6.25 per cent) are not consuming millets.

4.3 Millet Consumption by the Sample HHs by their age groups

Table 4.1 present the distribution of millets consumption among the sample population in the sample households in the Chandahandi block in Nabarangpur district. It shows that the rate of millets consumption is higher (50 per cent) among adults, followed by middle aged (21.26 per cent), adolescent (10.63 per cent), and aged (8.27 percent). While it is 7.48 per cent among children and 7.36 per cent among preschool children.

Table 4.1: Millets consumption by the Sample Population by their Age Groups			
Sl.	Age-Groups	N	%
1	Infant (0-2 yrs)	0	0
2	Preschool (3-5 yrs)	6	2.36
3	Children (6-12 yrs)	19	7.48
4	Adolescent (13-18 yrs)	27	10.62
5	Adult (19-44)	127	50
6	Middle Age (45-59)	54	21.25
7	Old age (60 and above)	21	8.27
Total		254	100

4.4 Consumption of Millets by the Sample Population in a Day

The distribution of millets consuming sample households by their millets consumption in their different meals of the day. It shows that majority 40 HHs (58.67 per cent) of them consuming it during lunch, while about 65.33 per cent of them consuming it during evening snacks and 53.33 percent in breakfast. (Table 4.2)

Table 4.2: Millets Consumption by the Sample HHs in different Meals of the Day		
Meals in a Day	N	%
Breakfast	40	53.33
Lunch	44	58.67
Evening Snacks	49	65.33
Dinner	0	0
<i>Source: Field Survey, 2023</i>		

4.5 Millets Consumption across Seasons

Table 4.3 presents the distribution of millets consuming sample households across seasons in Chandahandi block of the district. It is shows that all the millets consuming sample households consume it in the summer season, while about 11 samples HHs (14.67 per cent) of them consume it during winter and only 4 sample HHS (5.33 per cent) of them consume it during rainy season.

Table 4.3: Distribution of Sample HHs by their Millets Consumption across Seasons				
Seasons	Sample HHs	Total Amount (In kg.)	Average Amount (In kg)	%
Summer	75	2786	37.14	100
Rainy	4	82	4.88	5.33
Winter	11	122	9.01	14.67
<i>Source: Field Survey, 2023</i>				
<i>* Aggregate of the all season</i>				

Similarly, Table 4.3 presents the season-wise amount millets consumed by millets consuming sample households. The data indicates that millets consumption is significantly high during the summer, with 27.86 Qtls (37.14 kg per household), compared to winter at 1.22 Qtls (9.11 kg per household) and the rainy season at 82 Qtls (4.88 kg per household). Further, approximately 93.17 per cent of the total annual consumption occurs in the summer, while about 4.08 per cent and 2.74 per cent during winter and the rainy season, respectively.

4.6 Consumption of Millets Recipes

Table 4.4 shows that *Jau/Torani* is the most popular millets recipe in the study area as majority (97.33 per cent) of the sample population consume millets, followed by *Pitha/Tampo* (82.66 per cent) and *Khiri* it is found to be 78.66 per cent.

Table 4.4: Distribution of Sample HHs by the Millets Recipes they Prepare and Consumed		
Recipes	N	%
Pitha/ Tampo	62	82.66
Chhatua	0	0
Jau/Torani	73	97.33
Khiri	59	78.66
Idli/ Upma	0	0
Sweets items	0	0
Others	0	0
Source: Field Survey, 2023		

4.7 Conclusion

Findings of the Baseline Survey 2023 about the pattern of millets consumption among the millets consuming sample households across the two GPs of Chandahandi block in the district. It shows that millets consumption found throughout the years. However, the rate of millets consumption is higher in summer season than rainy and winter seasons. Most of the respondents, except for infants and preschool children, reported consuming millets. The lower rate of millet consumption among infants may be due to the dietary restrictions for new-borns or young children. Most of the respondents consume millets during lunch, breakfast, and evening snacks. *Jau/Torani* and *Tampo/Pitha* are the most popular millets recipe prepared and consumed by the sample households.

Chapter V

Processing and Marketing of Millets

5.1. Introduction

Baseline Survey 2023 aimed at recording the processing and marketing practised by the sample households in Nabarangpur districts. This chapter explores the various practice for processing of millets, such as threshing, de-stoning, cleaning, dehulling, and pulverising. It also examines the availability and accessibility of processing units in the sample area, and the factors that influence the choice of processing methods. Furthermore, this chapter analyses the different modes of selling millets, such as Govt. Mandi, direct sales to customer, cooperatives, middlemen, and online platforms. It also evaluates the distance to selling points and the transportation costs involved. The main objective of this chapter is to assess the status of processing and marketing of millets in the sample area and to identify the challenges and opportunities for improving the value chain of millets.

5.2. Processing of Millets

The distribution of sample households by their millets processing reflects the sample HHs adoption of any method (s) for processing their millets produce. The Baseline survey shows that out of the total sample households only 6 sample HHs (7.75 per cent) are households processing, while the remaining do not process.

Table 5.1: Distribution of Sample HHs by their Millets Processing

Millets Processing	N	%
Processed	6	7.75
Did not Process	74	92.50
Total	80	100

Source: Field Survey, 2023

5.3 Methods of Processing Millets

Traditionally people usually prefer to process millets manually by using *Chaki* or *Ghurna*, but nowadays due to technological innovation they use machines for it. As found in the Baseline Survey (Table 5.2) presents the distribution of millets cultivating sample households by the methods of millets processing. It shows that all of them processing their millets through traditional methods.

Table 5.2: Distribution of Sample HHs by their Method of Millets Processing

Methods of Processing Millets	Chandahandi Block	
	N	%
Traditionally	6	100
Machinery	0	0
Both	0	0
Total	6	100

Source: Field Survey, 2023

5.4 Millets Selling by the Sample HHs

Table 5.3 shows the distribution of millets cultivating sample households by their millets selling status. It shows that majority - four samples HHs (66.67 per cent) of the millets cultivating sample of households selling millets. Further it shows that majority 3 sample HHs (75 per cent) of the millets selling households sell their millets to middleman/ local businessman while about one fourth of them sell it in the local Market/ Haat.

Table 5.3: Distribution of Sample HHs by their Millets Selling

Millets Selling by the Sample HHs	N	%
Sold Millets	4	66.67
Did not Sale Millets	2	33.33
Total	6	100
Selling Point(s) of the Millets Selling HHs		
Selling at the Govt. Mandi	0	0
Selling the Middleman	3	75.00
Selling the Money Lender	0	0
Selling at the Haat	1	25.00
Total	4	100

Source: Field Survey, 2023

5.5 Conclusion

The processing and marketing of millets in the sample households in the selected village of Chandahandi block of Nabarangpur district under Baseline Survey 2023, Phase VII reveals that majority of households process their millets through traditional methods. Further, majority of households sell their millets to middleman/ local businessman.

Annexure 1: Mapping Baseline Survey Data, Nabarangpur District

Sl.	Indicators	Unit	Value
			Chandahandi
1	% Of Sample Households Cultivating Millets	%	7.5
2	Types of Millets Cultivated (2022)		
	a) Mandia	%	100
3	Avg. Area under Millets/HHs	Acre	1.33
4	% Of millets area to total cultivated area	%	2.08
5	Average Production of Millets (HHs)	Qtls.	2.08
6	% HHs by Package of Practice		
	a) Broadcasting	%	83.33
	b) LS	%	16.67
	c) LT	%	0
	d) SMI	%	0
7	Yield Rate (Qtls./Acre)	Qtls.	1.56
8	% Of HHs Consuming Millets	%	93.75
	a) Breakfast	%	53.33
	b) Lunch	%	58.67
	c) Evening Snacks	%	65.33
	d) Dinner	%	0
9	Popular Millets Recipes		
	a) Tampo/Pitha	%	82.67
	b) Jau/Torani	%	97.33
	c) Khiri	%	78.66
10	Percentage of HH using Processing Ragi		
	a) Manually	%	100
11	% Of Millets Cultivating HHs Selling Millets	%	66.67
	a) Middleman/ Local Businessman	%	75.00
	b) Daily Market / Haat	%	25.00

Households Schedule for**Baseline Survey 2023-24, Phase VII of SHREE ANNA ABHIYAN (SAA)**

Serial No.....

Date.....

Part-I: Socio-Economic Status**1. Profile of the Households**

1.1. Name of the Households' Head:

1.2. Name of the Respondent:

1.3. Name of the (i) Village: (ii) GP

(iii) Blocks: (iv) District:

1.4. Category: (i) SC (ii) ST (iii) OBC/SEBC (iv) Others (specify)

1.5. Religion (i) Hindu (ii) Muslim (iii) Christian (iv) Animism (v) Others

1.6. Ration Card Holding: (i) Ration Card (ii) Antyodaya Card (iii) Other (iv) No Card

1.7. Type of Family: (i) Nuclear (ii) Joint (iii) Extended (iv) Others (specify)

1.8. House Structure: (i) Katcha (ii) Semi-Pucca (iii) Pucca

3. HHs' Land ownership in Acre.....

4. Operational Holdings Under Different Crops (in Acre)

Sl No.	Name of the Crops	Yes/ No	Own Land*	Leased-in*	Sl. No.	Name of the Crops	Yes/ No	Own Land*	Leased-in*
a	Paddy				c	Vegetables			
b	Millets				d	Any Others Crops			
Total Operational Holding									

5. Annual Expenditure:

Sl. No	Source	Expenditure Heads						Total Amount (in Rs.)
	Agriculture	Land Preparation	Transplantation/ Sowing	Weeding	Fertilizers/ Pesticides	Harvesting	Others	
1	a) Millet							
	b) Paddy							
	c) Vegetables							
	d) Any Other Crops (Specify)							
3	Households Expenses							
4	Other HH Expenses							
	Total							

6. Annual income of the HH (last year.....)

7. Have you taken any agricultural loan? 1-Yes 2-No

8. If yes, please provide details.....

2. Household Particulars:

Sl. No	Name of the HH Members	Relationship with HoH (Use Code)	Age	Sex	Marital Status (Use Code)	Educational Qualification (Use Code)	Main		Subsidiary		Consume Millet (Yes/No)
							Occupation (Use Code)	Annual Income	Occupation (Use Code)	Annual Income	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Codes: Marital Status: 1- Married, 2- Unmarried, 3- Widow, 4- Widower, 5- Divorced, 6- Separated, 7- Any Others (pl specify)
Relationship: 1-Self, 2- Spouse, 3- Son, 4- Daughter, 5- Daughter-in-Law, 6- Son-in-Law, 7- Father, 8-Mother, 9-Brother, 10-Sister, 11- Grandson, 12- Granddaughter, 13- Father- in-Law, 14- Mother-in-Law, 15- Any Other (Specify)
Education: 1- Illiterate, 2- Up to Class 5, 3- Class 6-10, 4- Higher Secondary, 5- Graduate, 6- Post-Graduate, 7- Technical (Diploma/Degree), 8- Professional/Management, 9- Any Other (Specify)
Occupation: 1- Agriculture, 2- Daily Wage Labour, 3- Business/Entrepreneurship, 4- Govt sector, 5- Private Sector, 6- Pension/Remittances 7- Student 8- Housewife, 9- Unemployed, 10- Others (pl. specify)

Part-II: Production of Millets

9. Do you cultivate millets?

1-Yes 2-No

If yes, give millet-wise production details

Sl. No.	Millet Crops	Season	Area (in Acre)	Land Type Used	Sources of Irrigation	Type of Seed Used	Source of Seed	Quality of Seeds	Method of Cultivation	Use of Fertilizer	Use of Pesticides	Production (Qnt.)	Kept for Seed (Qnt.)	Kept for Consumption (Qnt.)	For Marketing (Qnt.)
a	Mandia	Kharif													
		Rabi													
		Summer													
b	Suan/ Kosla /Gurji	Kharif													
		Rabi													
		Summer													
c	Koda	Kharif													
		Rabi													
		Summer													
d	Any other (specify)	Kharif													
		Rabi													
		Summer													

Land Type Used: 1-Upperland, 2-Slope Land, 3-Middle Land, 4-Low Land.

Sources of Irrigation: 1. Rain, 2. Farm Pond, 3- Stream, 4- MIP/WS, 5-River, 6- Canal, 7- Bore well, 8-Others (Specify).

Type of Seed Used: 1-Local, 2- Certified, 3-HYV. Source of Seeds: 1-Own Seed, 2- Relatives, 3-Market, 4- NGO, 5- Govt./ Community Seed Centre, 6-Others (pl. specify)

Quality of Seeds: 1. Good, 2. Average, 3. Bad

Method of Cultivation: 1) SMI- System of Millets Intensification, 2) LT- Line Transplantation, 3) LS- Line Showing, 4) Broadcasting, 5) Others (specify)

Use of Fertilizer: 1) Organic Manure, 2) Chemical Fertilizers, 3) Both, 4) No Use. Pest Control: 1) Bio-Pesticides, 2) Chemical Pesticides, 3) Both, 4) No Use

10. Whether you follow mixed farming or mono farming system?
If mixed, with which are the crops(s)?

1. Mixed 2. Mono

11. How do you store your seed and grain?

- (i) Jute Bag (ii) Earthen Pot (iii) Bamboo Basket (iv) Pura (paddy rope)
(v) Open Hanging (vi) Other (Specify)

12. Had your seed or grain got damaged during last year?

1. Yes 2. No

13. Have you done weeding for the millets cultivation?

1. Yes 2. No

14. If Yes, Number of times you do weeding in your millet fields, by each method?

- 1) Manually_____ 2) By Weeder_____ 3) Both_____

15. If By Weeder, Sources of weeder?

- i) Own ii) Rental iii) Borrowed from Neighbours iv) Govt. Provided v) Other

16. If HH is not cultivating any of the millets, what is the reason?

- (i) Not profitable (ii) Shortage of land (iii) Non-availability of Seeds
(iv) Lack of Irrigation (v) Others (pl. specify)

17. How many years have you not cultivated Millets ?

18. Do you like to cultivate Millets under this programme?

1.Yes 2.No

Part-III: Consumption of Millets

19. Does your households consume millets?

1. Yes 2. No

If Yes, Types of millets your HH consumed in different seasons (Put Tick Mark)

Sl. No.	Name of the Millets	Winter				Summer				Rainy			
	Times	Breakfast	Lunch	Evening Snacks	Dinner	Breakfast	Lunch	Evening Snacks	Dinner	Breakfast	Lunch	Evening Snacks	Dinner
a	Mandia												
b	Suan/ Kosla / Gurji												
c	Koda												
d	Any Other Millets (Specify)												

20. Millets Requirements of the HH:

Sl. No.	Seasons	Millets Consumed (in Kg.)	Total Requirement of Millets (Kg.)	Sources of Millet Consumed by HH (in Kg)				Total
				Produced	Purchased	Borrowed/ Exchanged	Other Sources	
a	Winter							
b	Summer							
c	Rainy							
d	Total							

21. Consumption of Millets in different Recipes (Put Tick Mark)

Sl. No.	Name of The Millets	Pitha/ Tampo	Chhatua	Jau/ Torani	Khiri	Idli/ Upama	Sweets Items	Others (Specify)	Remarks
a	Mandia								
b	Suan/ Kosla/ Gurji								
c	Kodo								
d	Any Other Millets (Specify)								

22. Is there any special occasion when you prepare millets-based items?

1. Yes 2. No

If yes, what is/are the occasion(s) (specify)? _____

23. For this what type of millet is required (specify)? _____

24. Do you purchase Millet Based Products from market for consumption?

1.Yes 2.No

25. If Yes, what are the millets-based items you usually purchase from the market?

1. Biscuit/Mixture 2. Idli/Upama 3. Chhatua 4. Pakoda 5. Others (Specify)

26. How do you like the taste of millet-based products you purchased from market?

1. Liked it 2. So-so 3. Do not Like it

Part-IV: Processing of Millets

27. Do you process the millet products in your house?

1.Yes 2.No

28. If yes, who among your family members involved in the processing of millets?

i). Nos. of Male members _____. ii). Nos. of Female members _____

29. How do you process the millets? a) Traditionally b) Machinery c) Both d) Others (Specify)

30. If traditionally, please elaborate the methods of processing.

31. If Machinery, how far is the location of the processing unit from your village? _____km

Part-V: Marketing of Millets

32. Do you sell millets?

1. Yes 2. No

33. Types of Millets, you Sell and Quantity

Sl. No.	Millet Crops	Yes /No	Sources of Millets You Sale	Quantity	Price / Kg.	Govt. Price (MSP)	Where did you sell your millets	Distance in Km	Mode of Transportation Used for Millets Sale	Reason for Sale
a	Mandia									
b	Suan/ Kosla /Gurji									
c	Koda									
d	Any other (specify)									

Sources of Millets You Sell: 1. Own Produced, 2. Purchase from Farmers, 3. Others (Specify)

Where Sold Your Millets: 1. Govt. *Mandi*, 2. Middlemen/ Local Businessman, 3. Moneylender/ *Sahukar*, 4. Daily market/ Haat 5. Others (pl. specify)

Mode of Transportation: 1. Headload, 2. Cycle, 3. Cart, 4. Own Vehicle, 5. Hired Vehicle, 6. Public Transport, 7. Others (Specify)

Reason for Sale: 1. Better Price, 2. Immediate Need of Cash, 3. Loan Repayment, 4. Non-Availability of Market, 5. Any Others (specify)

34. Any instance of distress sale (less than the market price) of Millets?

1.Yes 2.No

35. If yes, what is the sale price.....and what is the market price.....

36. What are the marketing processes followed by you?

a) Barter

b) Money

c) Others (specify)

37. Do you sell any millet based value-added products?

1.Yes 2.No

38. If yes, provide the details about the Millet Based Value Added Products you sale.

39. Remarks

Contact no of Respondent

Signature of the Researcher/Field Investigator

CONTRIBUTORS

Dr Sanghamitra Panda

Dr Rajadarshini Patra

Mr. Linus Lakra

Ms. Sandhyarani Dora

Ms. Kajal Pradhan

Ms. Subhashree Lenka

Ms. Sumitra Rani Pradhan

Mr. Md Saidul Islam

Mr. Prasanta Kumar Sahu

Ms. Subhashree Lenka

Ms. Swayamprajna Pattanaik

Ms. Pusapanjali Lenka

Mr. Hemanta Mahananda

Mr. Sukanta Kumar Pradhan

Ms. Madhusmita Choudhury

Mr. Smruti Ranjan Sahoo

Ms. Gayatri Nayak



ନବକୃଷ୍ଣ ଚୌଧୁରୀ ଉନ୍ନୟନ ଗବେଷଣା କେନ୍ଦ୍ର
Nabakrushna Choudhury Centre for Development Studies
ICSSR Institute in Collaboration with Government of Odisha



About NCDS, Bhubaneswar

The Nabakrushna Choudhury Centre for Development Studies (NCDS), established in March 1987, is registered under the Societies Registration Act, 1860. It is being jointly funded by the Indian Council of Social Science Research (ICSSR), Ministry of Human Resource Development, Government of India and Planning & Convergence Department, Government of Odisha. Focussing on socio-economic research, this institute is the only one of its kind that serves as a policy think tank in the state of Odisha.



Nabakrushna Choudhury Centre for Development Studies (NCDS)

An Indian Council of Social Science Research (ICSSR) Institute in Collaboration with Government of Odisha, Bhubaneswar - 751013, Odisha, India

☎ +91-674-2301094, 2300471 ✉ ncdsbbsr1987@gmail.com 🌐 <http://ncds.nic.in>

📘 @ncdsbhubaneswar 🐦 @ncds_